

THE SPERRY
UTS 4000 FAMILY



UTS 4000 Family



Sperry affirms its leadership in intelligent terminal technology with the UTS 4000 universal terminal system family.

They are terminals that do more, so that you can do more.

UTS 4000 is not just a single terminal, but rather a comprehensive family. It's a family with a wide performance range—one that lets you enter anywhere, go anywhere, whatever your needs may be.

The UTS 4000 family of interactive, general-purpose terminals includes:

- the UTS 10 teletype-mode CRT
- the UTS 20 editing CRT
- the UTS 30 editing/programmable CRT
- the UTS 40 programmable CRT
- the UTS 4020 cluster controller
- the UTS 4040 cluster controller

The terminals are both compatible with modes you have used in the past and powerful enough to offer you new and broader capabilities. The family ranges from a low-cost, non-programmable terminal all the way up to the 4040 cluster controller, which gives you 2M bytes of user read/write memory and can accommodate up to 32 display stations and 48 peripheral devices.

These characteristics provide the UTS 4040 cluster controller with a great deal of power for distributed processing applications.

Extensive new program products complement the hardware—software support that lets you distribute more significant applications to your terminal system. And, of course, a broad selection of peripheral devices accompanies the UTS 4000 family.

The UTS 4000 family performs all the usual input/output roles of past terminal systems, but it does so with an efficiency never achieved before. Its sophisticated hardware design—using state-of-the-art large-scale-integration technology—and its advanced software support are combined to give it an extremely powerful and versatile functionality at a truly competitive price.







The UTS 10 Teletype-Mode CRT

The SPERRY UTS 10 is a low-cost, Teletype compatible communications terminal with a 12-inch diagonal CRT display. It is a freestanding microprocessor-based terminal designed to operate as either an Unbuffered Teletype (Character Operating Mode) or as a Buffered Teletype (Block or Character Operating Mode). The operating mode or "personality" of the UTS 10 is provided by means of a program cartridge which plugs into the back of the unit.

The Unbuffered Teletype (Character Operating Mode) consists of the 12-inch CRT and a detached typewriter keyboard with 70 keys. The data keys are positioned in accordance with ISO 3243. It also includes the program cartridge for the unbuffered teletype mode of operation. In this mode, characters are

transmitted as they are entered; therefore your operator may not correct previously keyed-in data prior to transmission.

The UTS 10 operating in unbuffered teletype mode serves as a console device or as a teletype replacement device for users who do not wish to upgrade the functionality of their existing teletype devices. Available options include a tilt/rotate base, security keylock feature and a low-cost 80-column matrix printer.

The Buffered Teletype (Block or Character Operating Mode) consists of the 12-inch CRT and a detached expanded keyboard of 94 keys, with the data keys positioned in accordance with ISO 3243—plus the program cartridge for buffered teletype mode operation. The latter actually runs either character or block mode transmission based on operator key-in.

Block or operating mode allows full-screen applications using operator prompts, menu selection and source data entry forms (fill in the blanks). In this operating mode, device control is provided for protected formats, field highlighting and partial screen transmission. A wide range of editing capabilities allows your operator to check the data and correct errors prior to transmission.

The buffered teletype device provides extra cost options for a magnetic stripe reader as well as all options available on the unbuffered unit. When a printer is used in buffered mode, a line at a time may be sent to the UTS 10, stored and printed without disturbing data on the screen.

The UTS 20 Editing CRT

The SPERRY UTS 20 is a microprocessor-based communications terminal with a 12-inch diagonal CRT display. It offers the expanded functionality of a UNISCOPE 100 or 200, plus many UTS 400 features at lower cost.

It is designed to be compatible with currently installed SPERRY UNISCOPE 100/200 and UTS 400 terminals, thus protecting your investment and allowing for low-cost expansion. It can also be used for new networks or applications where extensive data editing capabilities are required without user programmability of the terminal.

Two basic versions of the UTS 20 are available—the single station UTS 20 and the cluster workstation UTS 20W. As a cluster workstation, the UTS 20W is directly attachable to the UTS 4020 or 4040 cluster controller. Up to 12 or 32 workstations respectively can be locally attached.

The personality of the UTS 20 single station is user-selectable by means of a program cartridge which plugs into the back of the unit. Available program cartridges include:

- ▣ UTS 400 Mode—compatible with applications now employing UNISCOPE and/or UTS 400 terminals

- ▣ BSC Mode—Communicates using the Binary Synchronous Communications protocol
- ▣ Screen Bypass—UTS 400 mode enhanced with a screen bypass capability

As a single station, the UTS 20 comes equipped with an RS232C/V24 communications interface which lets you connect it to a host system from remote locations. Line sharing is achieved by multidropping or multiplexing via the SPERRY Terminal Multiplexer.

A direct-connect feature lets you bypass modems when the terminals are located at your host site.

The UTS 30 Editing/ Programmable Terminal

The UTS 30 display station is a powerful terminal/desktop computer, supporting a wide range of printers and up to two diskette subsystems. The basic version of the UTS 30, designed as an editing terminal, can be easily field upgraded to the programmable version by replacing a program cartridge with a diskette interface and attaching a diskette subsystem.

The UTS 30 consists of a 12-inch diagonal display and low profile keyboard. The non-glare display is flicker-free and produces extremely sharp characters. Brightness and background contrast are operator adjustable. An optional tilt/rotate base is available, or the display may be placed directly on top of the low profile diskette cabinet. Additionally, special tilt/rotate base can be incorporated into the diskette casework.

The programmable UTS 30 supports either UNISCOPE or UDLC (DCA compatible) protocols, thus retaining UNISCOPE device compatibility and UNISCOPE program compatibility. The UNISCOPE protocol is supported by the UNISCOPE System Control Software, while the UDLC protocol is supported by the DDP-4000 System Control Software.

In either mode, Sperry host compatibility using UTS COBOL programs is retained by downline loading them for execution on the UTS 30. A wide variety of utility and application programs execute on the UTS 30. CP/M Plus* is also available for the UTS 30.

While serving as a traditional interactive terminal, the UTS 30 offers extended functions to meet advanced needs.

*CP/M and CP/M Plus are registered trademarks of Digital Research, Inc.



The UTS 40 Programmable CRT



UTS 4000 Program Cartridges

The SPERRY UTS 40 is a microprocessor-based intelligent communications terminal which is user-programmable, with up to 64K bytes of user memory. It can support a wide range of peripheral devices including printers, diskette subsystems and magnetic stripe reader (see Figure 1).

The UTS 40 consists of a 12-inch diagonal CRT display and selection of four different pluggable keyboards. It is available as a single station which communicates with a host system via an RS232/V24 modem interface or via a direct connect to a host communications multiplexer. Emphasis attributes may be combined at will, e.g. a low-intensity blinking field on a reverse video background. Underscore and strike-through symbols may be superimposed on text characters.

Two basic versions of the UTS 40 are available—the single station UTS 40 and the cluster workstation UTS 40W. As a cluster workstation, the UTS 40W is directly attachable to the UTS 4020 or UTS 4040 cluster controller. Up to 12 or 32 workstations respectively can be locally attached.

The personality of the UTS 40 is provided by a program cartridge which plugs into the back of the unit. A UTS 400 mode program cartridge is provided which allows the UTS 40 to operate in existing networks of UNISCOPE and UTS 400 terminals. The UTS 40 may be programmed on Series 1100, Series 90 and System 80 host systems, using the UTS COBOL compiler. In addition to executing these COBOL programs, a wide variety of utility and application programs are available on the UTS 40. The UTS 40 can also operate under CP/M Plus, a popular microprocessor operating system. With these powerful programming aids, UTS 40 combines most of the characteristics of a desktop computer with all the traditional capabilities of an interactive terminal.

Program cartridges add many advantages to the UTS 4000 family of terminals. They are used in all single stations and allow the stations to take on various personalities providing different functional capabilities. In addition, they offer the user the capability of incorporating system updates by simply inserting a new cartridge into the terminal. They also provide a means of taking advantage of future terminal enhancements without having to upgrade to an entirely new terminal.

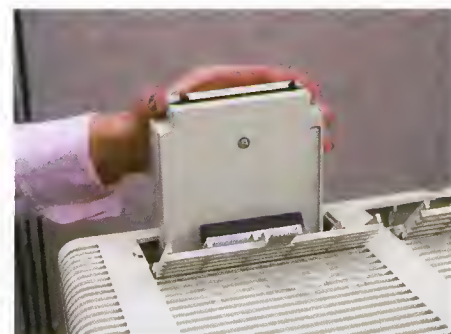
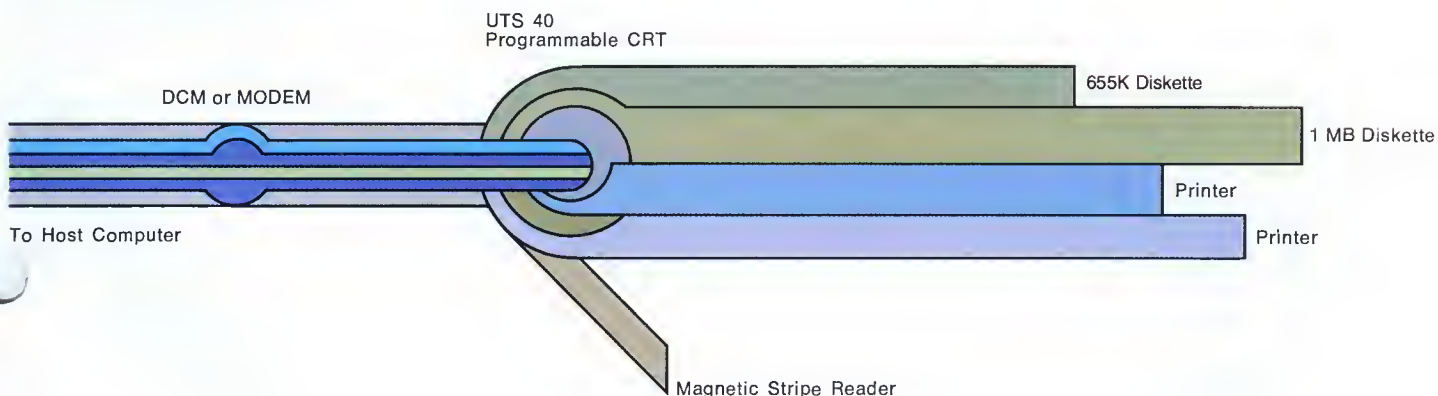


Figure 1
UTS 40 Configuration Schematic



The UTS 4020 & 4040 Cluster Controllers Economy and Efficiency

The SPERRY UTS 4000 Controllers bring a new level of economy and efficiency to cluster-type hardware. The reason is new large-scale-integration techniques which allow more and more circuitry to be enclosed in electronic "chips." And because the cluster arrangement

is modular in concept, you can use a "building-block" approach to your system. So you can begin with only the equipment you need and expand your system as your needs grow—easily, and without impacting any functionality.

The UTS 4020 cluster controller—about the size of a desk drawer pedestal—can hold a maximum of 1M bytes of memory and can control

as many as 12 workstations and 16 peripheral devices (see Figure 2a). Additional printers may be attached directly to the workstations.

The UTS 4040 cluster controller is compatible with the 4020 but offers more capability. It can hold a maximum of 2M bytes of memory and can control up to 32 workstations and 48 peripheral devices (see Figure 2).

Figure 2
UTS 4040 Configuration Schematic

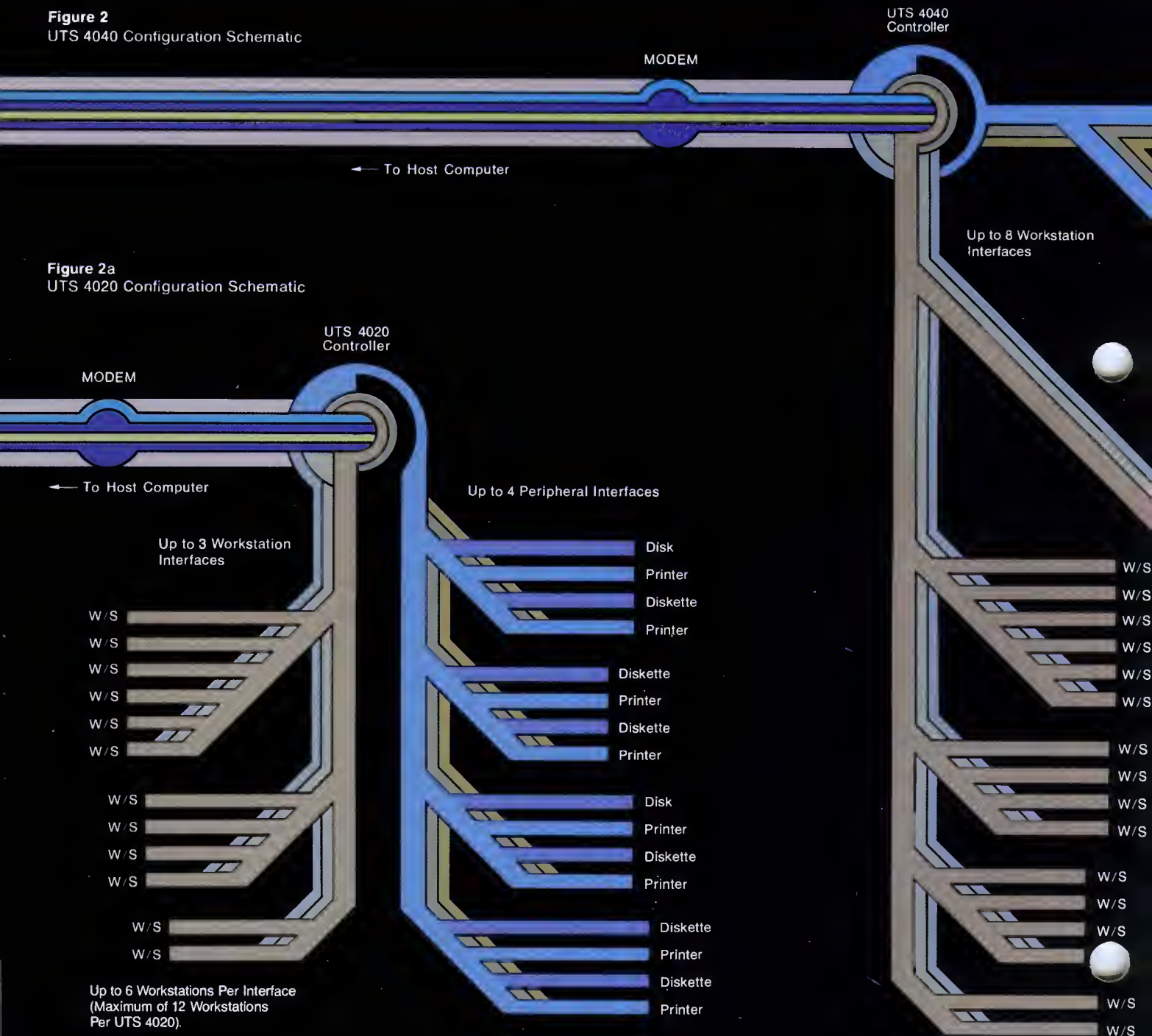
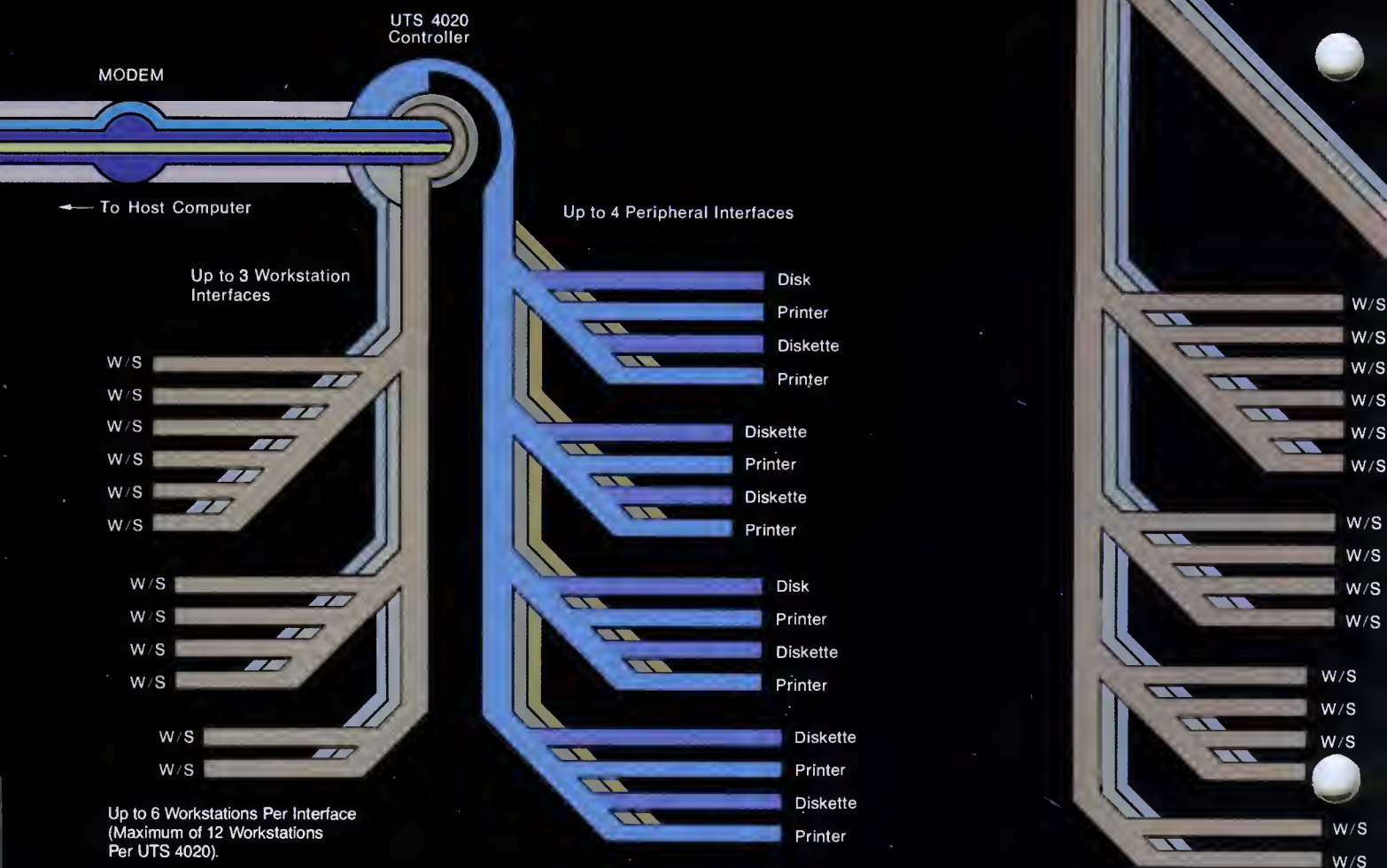


Figure 2a
UTS 4020 Configuration Schematic



Note: Printers and Diskettes may also attach to UTS 40W Workstations

Up to 6 Workstations Per Interface
(Maximum of 32 Workstations
Per UTS 4040).

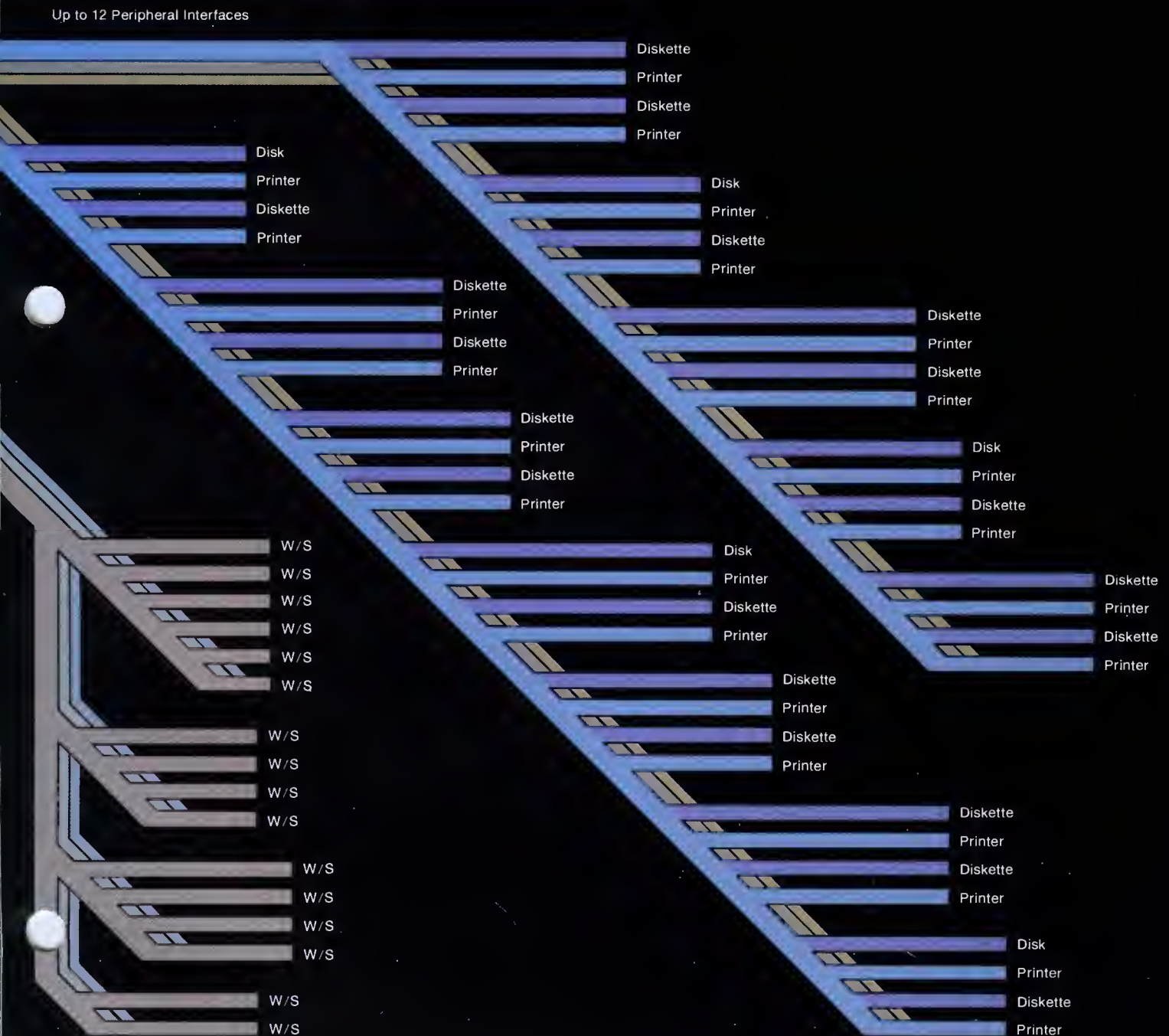
Each UTS 20W or UTS 40W workstation for the UTS 4020 is a semi-independent, intelligent microprocessor-controlled CRT terminal. Each runs its own microcode program, loaded initially by the cluster controller—which handles everything in a configuration.

In programmable mode, the cluster controller may process data locally for

the individual workstations, thereby offloading the host processor. And when one of the workstations in a cluster needs interfacing with the host, the cluster controller supplies it at rates up to 19,200 bits per second!

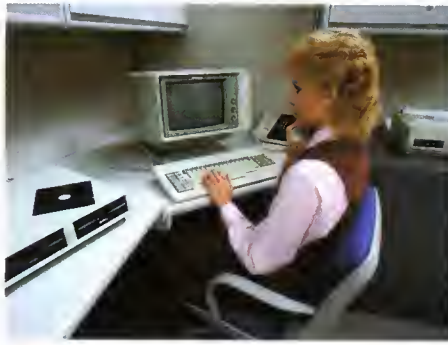
Beyond the distributed processing power of the UTS 4020 system, there is the added efficiency of the operator orientation. A human-engineered

terminal design has been combined with easy-to-use control procedures to make your operators feel that the system has been tailor-made to their specific job requirements. You may further enhance the man/machine interface by using the user programmability to tailor the terminal system to specific applications.





Versatility, Programmability, Functionality



The cluster controllers form a small but powerful terminal computer system using microprocessors both in the controller and in the workstations. Like a large host processor, the UTS 4000 controller systems use a combination of macrocode and microcode instructions stored in random-access memory to provide its functionality.

Unlike a large host processor, however, the UTS 4000 systems load its software program from a small diskette which is built into the cluster controller. Because of this, the UTS 4000 is easily made operational. Your individual user

programs written in standard COBOL programming language can be quickly and easily loaded either via mass storage or from your host processor.

In addition to the functional utilities built into the system software, you can apply specific user programs to supplement the basic personality of the system. In the hands of an imaginative programmer, this capability can greatly increase the basic responsiveness and functionality of the system.

The supervisor allows up to 10 user programs in the UTS 4020 and up to 20 in the UTS 4040 to run

simultaneously—a capability unheard of in previous clustered systems. In effect, nearly every workstation can run a separate user program—each of which is resident in the cluster controller—simultaneously.

Since the UTS 4000 cluster controllers and workstations are microprocessor-based devices, their functionality is derived largely from the UTS 4000 program products. This design approach has been key to the successful development of the system, and will remain key to its maintenance and future enhancement.

Communications Interaction

The UTS 4000 cluster controllers can interact with your host processor in synchronous ASCII code—the industry standard—at rates of up to 19,200 bits per second.

The communications control procedures, either UNISCOPE or UDLC, are complete and comprehensive. Anticipating every communications problem, these procedures provide simple, straightforward solutions.

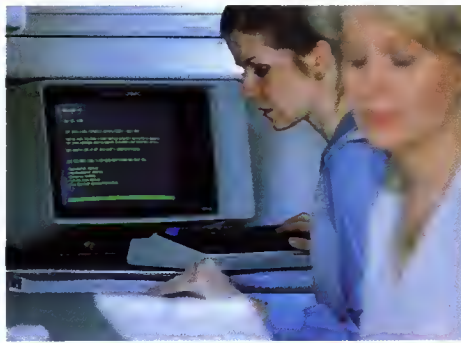
The UTS 4000 system is designed to become an integral part of your communications system. Telephone line cost was a major consideration in its design. The UTS 4000 system reduces this cost by increasing the number of terminals on a telephone line, by decreasing the amount of time needed to send a data block to the host processor, and by expanding the local processing capabilities within the cluster.

Expandability

Expandability has been designed into the UTS 4000 system. The minimum hardware and software operates in non-programmable mode, and as your needs expand, you can add to your terminal system in simple steps.

Some hardware additions to the system require only software parameter changes. Workstations and peripherals can be added without the need for new interface modules, unless the number of additional units exceeds the available interface positions. The only time you need to add software is when you want to expand the system's functionality. The System Control Software provides the UTS 4000's basic capabilities.

Extensions thereto or complete local applications are achieved through the addition of your own unique user programs. This is one of the major benefits of UTS 4000 user programmability.



UTS 4000 Program Products

Program products are offered for UTS 4020 and UTS 4040. A UTS COBOL compiler for UTS 30, UTS 40, UTS 4020 and UTS 4040 is available on Series 1100, Series 90 and System 80 host systems.

The **UTS 4000 System Control Software** is a prerequisite for all other program products used by the UTS 4000 controller.

The **UNISCOPE Mode System Control Software** consists of a supervisor, workstation logic, support for all peripherals, diskette or disk file management, support for the interface which links the cluster controller to a host processor and system utilities.

The **DDP-4000 System Control Software** provides Distributed Communications Architecture (DCA) compatibility and operates in conjunction with DCP/Telcon and CMS 1100. Providing DDP verbs and Remote Batch commands which pair with Series 1100 software, DDP-4000 allows the design of powerful heterogeneous DDP networks.

In addition, the System Control Software supports the large capacity 8409 disk subsystem employing Indexed Sequential Access Method (ISAM).

UNISCOPE screen format control and UNISCOPE application program compatibility are retained by DDP-4000.

In addition to the System Control Software, you may select other program products which serve as program development tools. Each of these requires some amount of storage space in the cluster controller in addition to the basic configuration. Up to 896K bytes (UTS 4020) or 1792K bytes (UTS 4040) of additional

memory may be configured in the cluster controllers.

UTS COBOL is a program product which provides host compilation and downline loading of user programs for execution in the UTS 4020, the UTS 4040, the UTS 40 and the UTS 30. User object programs may be placed on mass storage for later local load. UTS COBOL is based on a subset of the ANSI X3.23-1974 standard and includes significant syntax extensions for terminal functions such as screen management.

The **Edit Processor** gives you the ability to perform text-handling functions on resident data files. It allows your operator to identify a file to be edited, then temporarily stores changes in a mass-storage device. When your operator issues the appropriate command, the updated file is saved in the allocated data space and the old file is replaced. The Edit Processor will be used often by programmers to maintain source code files. One of the great advantages of this program product is that it takes edit functions off-line; these activities no longer require the use of expensive host processor time.

The Edit Processor resides in the UTS 4020 and UTS 4040 cluster controllers or in the UTS 40 and UTS 30 single station. It may be used, however, to develop COBOL programs which may execute on either the UTS 4020, UTS 4040, UTS 40, UTS 30 systems, or host systems.

UTS BASIC is provided for users who wish to generate programs on the UTS 4000 cluster controller in the stand-alone mode. UTS BASIC conforms to the American National Standard Institute requirements for minimum BASIC (ANSI X3.60-1978) and has extensions for input/output, program

manipulation, program control, additional arithmetic and string functions, and UTS terminal oriented functions.

The **Text Processing Utility (TPU)** operates on the UTS 4020, UTS 4040, UTS 40 and the UTS 30. It allows creation, modification, formatting and printing of textual material as well as transmission of it to a host processor. TPU also permits the storage of documents on diskette, document selection and retrieval, and other document maintenance procedures.

The **Loadable Character Set Generator (LCSG)** allows the interactive creation, modification and copying of loadable character set definitions. It operates on SPERRY computer systems. Generated on a host system, character sets can be down-line loaded to the UTS 40.

The **File Transfer Utility** allows users to transfer symbolic files between mass storage on the cluster controller and mass storage on a Sperry host system—Series 1100, Series 90, or System 80. The files may be transferred in either direction. The File Transfer Utility also controls printing of symbolic files from local or host mass storage. This utility operates in conjunction with the host-resident editor.

CP/M (CONTROL PROGRAM/MICROPROCESSOR) is a standalone operating system adding personal computing to the other facilities of the UTS 30, UTS 40 and UTS 40W. Many applications, programming tools, and utilities are widely available for use with CP/M. With the UTS 30, UTS 40 and UTS 40W you have the unique ability to convert files between UTS 4000 and CP/M file formats.



Powerful Peripherals

A full line of peripherals is available within the UTS 4000 family to allow you to configure your system to meet all your application requirements. These include:

- 8439 5¼" Diskette
- 431 Correspondence Quality Printer
- 0797 80-Column Impact Printer
- 0798 132-Column Impact Printer
- 425 132-Column Impact Printer
- 0789 Line Printer
- 8406 8" Diskette
- 8409 Disk Subsystem

Any of the above may be attached to the UTS 40 and the UTS 4020, or UTS 4040, except that the UTS 40 cannot interface to the 8409, while the 8439 cannot attach to cluster controllers. Only the 0797 printer attaches to the UTS 10, while the UTS 20 supports both the 0797 and the 0798 printers. The UTS 30 can use the serial printers and the 8439 diskette.

The **0789 Line Printer** is offered in three models which are rated, with a 48 character set, at 180, 300, and 640 lines per minute respectively. All three models offer 132 print positions as standard. Six or eight lines per inch spacing is operator selectable. The

640 LPM model is available only with the UTS 4020 and UTS 4040.

The **0797 80-Column Impact Printer** is a character-by-character impact printer operating at a rate of 80 characters per second. It uses a 9 x 7 half-space dot matrix. Characters are spaced horizontally 10 characters per inch. Vertical line spacing can be either 6 or 8 lines per inch. Many different font selections are available. The printer can produce an original plus two additional copies.

The **425 132-Column Impact Printer** is a serial character printer available in two models. A single mode model operates at 160 characters per second, with bi-directional printing, using a 9 x 7 dot matrix. A dual mode model provides selective high quality printing using an 18 x 40 matrix at 40 characters per second, in addition to the basic 9 x 7 format. Other features include multiple print pitches and elongated characters.

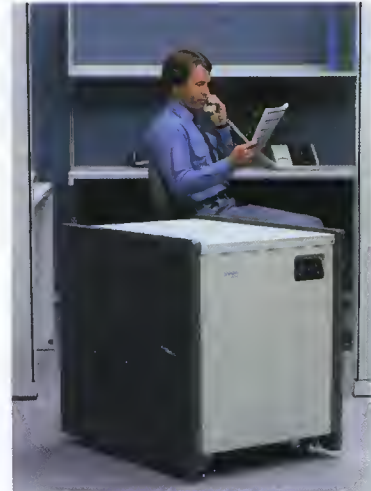
The **0798 132-Column Impact Printer** is a character-by-character serial printer operating at 200 characters per second. It offers bi-directional printing, and uses a 7 x 7 half-space dot matrix

in forming characters. Either a 64 or 96-character set is available in ASCII and various national sets. Six or eight lines per inch spacing, document-parting bar, compressed print and other options are available with this printer.

The **SPERRY 431 Correspondence Quality Printer** produces exceptionally fine print quality using a daisywheel print mechanism. Operating at a productive rate of 55 characters per second, the 431 is especially suited for executive correspondence, reports of authoritative appearance, finished textual material and impressive sales-related documents.

A wide selection of character fonts are available. Numerous forms can be accommodated by a friction platen, continuous forms tractor, and a cut form feeder.

The freestanding **8406 One-Megabyte Diskette** is a small, cost-effective unit which uses a flexible disk about the size of a 45-rpm phonograph record. The unit offers an optional second diskette drive. Each double-sided diskette has one megabyte storage capacity, 77 data tracks and a track



format of 26 sectors at 128 bytes per sector. Average access time is 260 ms, with average latency time of 83 ms. The transfer rate is 62.5K bytes per second.

The **SPERRY 8409 Disk Subsystem** is a mass storage device that can store up to 47.5 million bytes of information. The disk subsystem can be attached to cluster controllers. Each subsystem cabinet can house a maximum of two disk drives which are offered in capacities of: 23.75MB, 14.25MB and 4.75MB. Disk drives of different capacities can be mixed in the same cabinet.

The disk drive uses non-removable media and employs a single head/disk assembly (HDA) per recording surface. Disk latency is an average of 8.33 milliseconds and a maximum of 16.6 ms, with access times of 12 ms minimum and 45 ms maximum. The data transfer rate is 625 kilobytes per second.

The **SPERRY 8439 Diskette Subsystem** uses 5¼ inch flexible diskettes that have a capacity of 655K bytes when formatted at 512 bytes per sector. The data format will be common for all programs on the UTS 30. The 8439 is the only diskette subsystem supported by the UTS 30.

When used on the UTS 40 single station, the 8439 diskette subsystem will be supported by the Diskette Utility for converting from 8-inch diskettes. The 8439 will also be supported by CP/M Plus.

Peripherals for the UTS 4000 cluster may be configured in two ways—either connected to the UTS 4020 or 4040 cluster controller or to the workstations. Peripherals may be scattered throughout your UTS 4000 cluster to fit your needs for shared or dedicated peripherals.





UTS 4000 Family—Human Engineering



The UTS 4000 family of visual displays was designed with the idea that operator effectiveness is one of the keys to more efficient data communication.

Human factor evaluations and accumulated experience were heavily considered in the design of the UTS 4000 family man/machine interface. Thus, the visual displays are designed for easy and straightforward operation, completely eliminating the need for any awkward head or body positions. Keyboards are designed with an extremely low profile for the most comfortable touch-typing.

The UTS 4000 family screen display is bright and easy to read, yet the green phosphor is not tiring to the eyes.

We at Sperry also understand that no fixed-position terminal will please every operator consistently. Therefore, we've designed our workstations with detached keyboard, plus an optional tilt/rotate base. This feature is essentially a platform into which the base of the workstation fits. With it, the operator can adjust the position of the terminal so that it swivels or tilts up and down. These adjustments, coupled with the detached keyboard, maximize operator comfort and thus maximize operator output. Additionally, a low-profile keyboard is available, resulting in even more operator comfort.

Immediately available on the keyboard are all the keys your operator needs to control the terminal and the data transfers. Thus, the operator need not leave the visual display to attend to a peripheral. An operator selection is provided which causes the terminal to generate an audible feedback for every successful keystroke. The typewriter-type keyboards are familiar to most operators, and thus no special familiarization is needed. Character sets in English and many other languages, including Katakana, are available.

The above are just a few examples of features designed to satisfy human factors and thereby increase efficiency.

UTS 4000 Family—Compatibility

Sperry uses a unique "family of products" concept assuring you that the UTS 4000 terminals are compatible with your previous SPERRY terminal systems and your newer DCA systems.

Because of this, the UTS 4000 family can be readily configured into your existing network with UNISCOPE 100 and 200 display terminals, UTS 400 terminals, as well as with DCP/Telcon networks.

Application program compatibility and screen control compatibility have been retained, so that either UNISCOPE or UDLC line disciplines can be used.

Beyond network compatibility, there is operator compatibility. Any operator familiar with the UTS 400 will be rapidly productive in the UTS 4000 family. Operators will be comfortable with the similar screen formats—such as the control page—and the control interfaces to the host processor and peripherals.

The only changes designed into the UTS 4000 family from previous systems are those that increase efficiency. Functions are performed more quickly, and functions not previously possible are now available.

UNISCOPE 100, 200 and UTS 400 compatibility is not the only form of compatible operation. The UTS 10 offers two widely used teletype protocols, Keyboard Send/Receive 33 and ANSI 3.64 device control. KSR 33 compatible devices are supported on Series 1100 and Series 90 mainframes, while V77 minicomputers support devices with ANSI 3.64 control codes. The UTS 20 offers Binary Synchronous compatibility.

UTS 4000 Family—Reliability

Reliability and data integrity are assured in the UTS 4000 family. They derive from parts quality, manufacturing quality, internal handling procedures for spurious errors, extensive power-on confidence tests, comprehensive automatic through-checking of data paths, and an exhaustive diagnostics and repair strategy.

A built-in power-on confidence test provides a simple proof that the hardware is operational. And should a component failure occur, the test program will detect the condition and report it via indicator lights on the cluster controller, or with a screen display at the terminal. Our customer engineer can also use the power-on confidence test program to exercise the hardware and study its condition.

The major portion of the family's random-access memory is protected by error-detection codes which sense single-bit errors. Spurious parity errors found in I/O data paths are automatically eliminated by re-tries. This separates intermittent errors from repeatable errors. Errors are also logged for later analysis.

The UTS 4000 Family—Terminals That Do More So That You Can Do More

Functionality. Versatility. Power. Reliability. Expandability. Economy. Efficiency. Programmability.

All these factors and their benefits are combined in the SPERRY UTS 4000 family of terminal systems.

The UTS 4000 family satisfies your requirements for distributed processing clusters, for communications, for day-to-day processing and for personal/desk-top computing.

A design based on human factors has been combined with state-of-the-art technology to offer you a remarkably powerful, versatile and price-competitive terminal system.

The UTS 4000 family affirms the leadership of Sperry in terminal design.

It is a family of terminals that does more—so that you can do more.





We understand how important it is to listen.